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Sensitivity of West african climate to CLM

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Sensitivity of West african climate to CLM

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I. Objective

Question : Does CLM improve the representation of West african climate main

features ?

1. We performed 2 runs (BATS scheme and CLM model)
2. BATS and CLM runs are intercompared and validated with ERA-Interim reanalysis and GPCP rainfall
3. Simulation lengh : 3 months per run (June to Agust 2006)

II. MODEL CONFIGURATION

- **Physics** :
  - **- Spatial resolution :**

    ➢ *Horizontal - 60 km (108 grid points in x*

    direction and 96 in y direction)

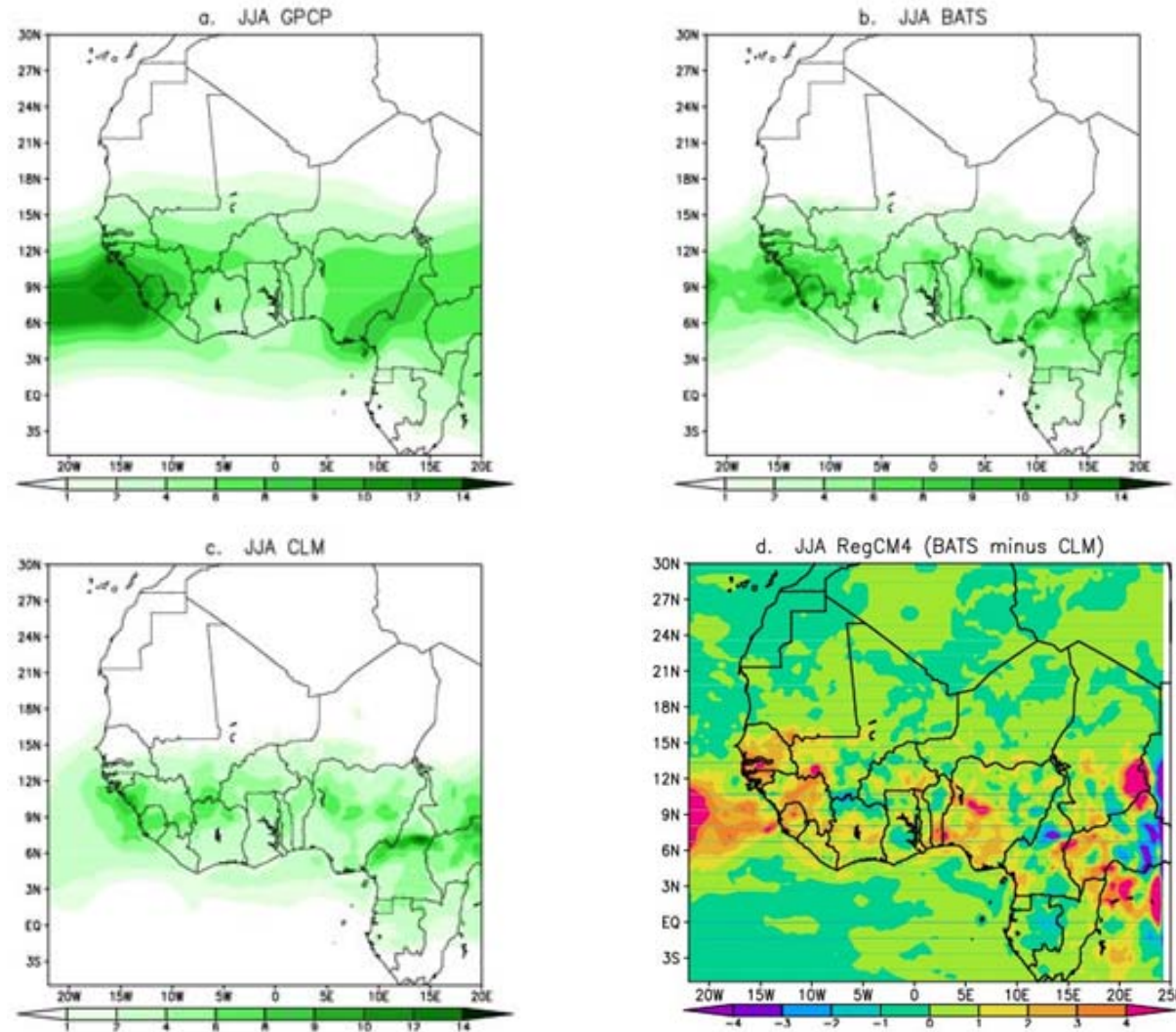   ➢ *Vertical - 18 levels*
  - **- Convection Scheme :**

    ➢ *GRELL / FC closure*

    ➢ *Land surface scheme : BATS or CLM*

   **Initial & lateral boundary conditions** : *ERA-INTERIM*

III. Results
## (Mean June-July-August 2006)

Rainfall

- **RegCM4 (2 runs) realistically simulates West african rainfall zonal distribution and maxima over Fouta Djallon and Jos.**
- **Model runs underestimate rainfall over the maxima regions and Sahel especially the CLM run (BATS did a better job than CLM)**

Surface Temperature
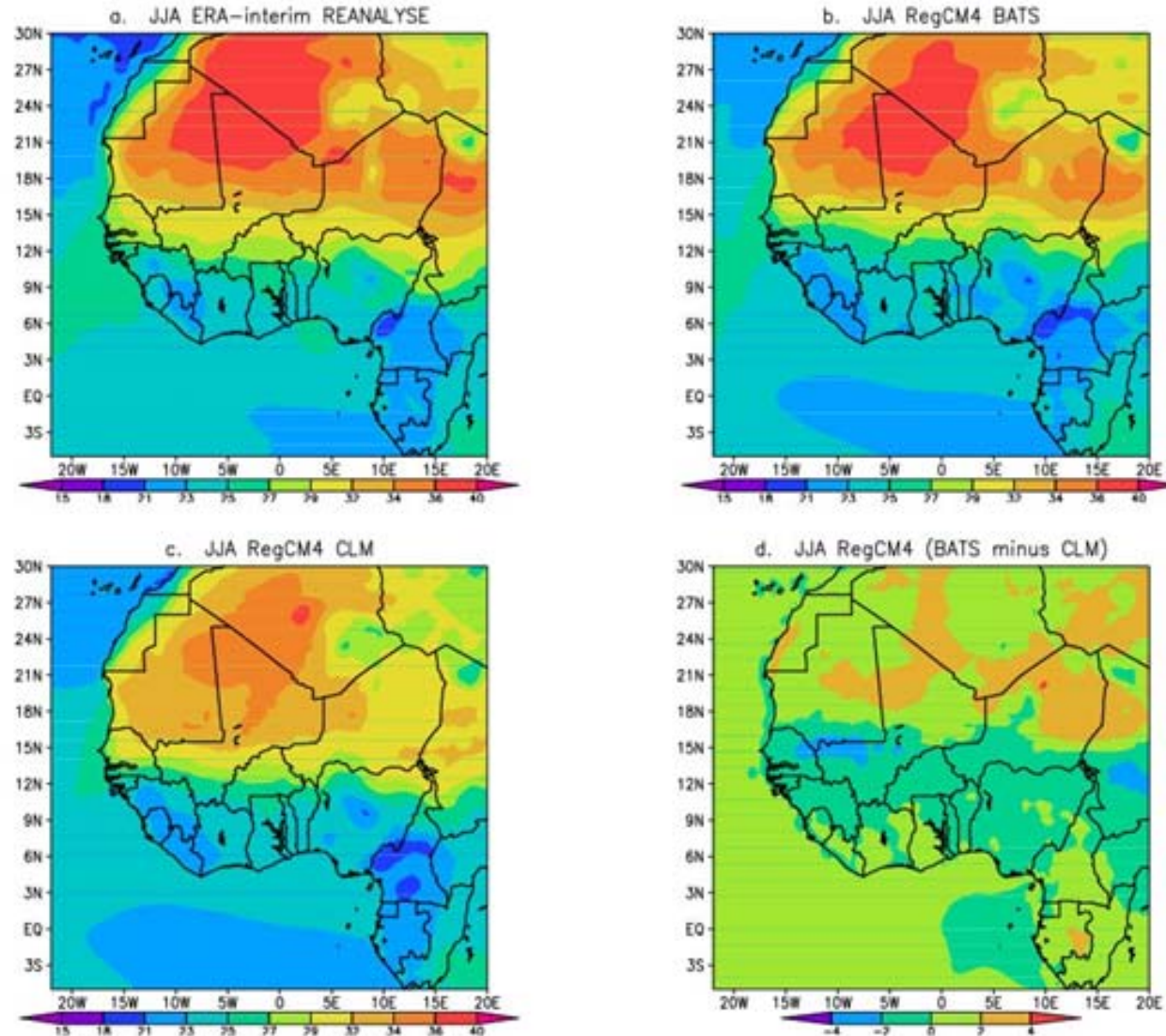
- **Good representation of West African Surface Temperature characteristics (cooler temp over Guinean region and warmer temperature over the Sahara).**
- **RegCM4 runs underestimate Temperauture over Sahara especially CLM**
- **BATS captures better Sahara maximum temperature.**

Wind at 925 hPa

a. JJA ERA-interim REANALYSIS
b. JJA RegCM4 BATS
c. JJA RegCM4 CLM
d. JJA RegCM4 (BATS minus CLM)
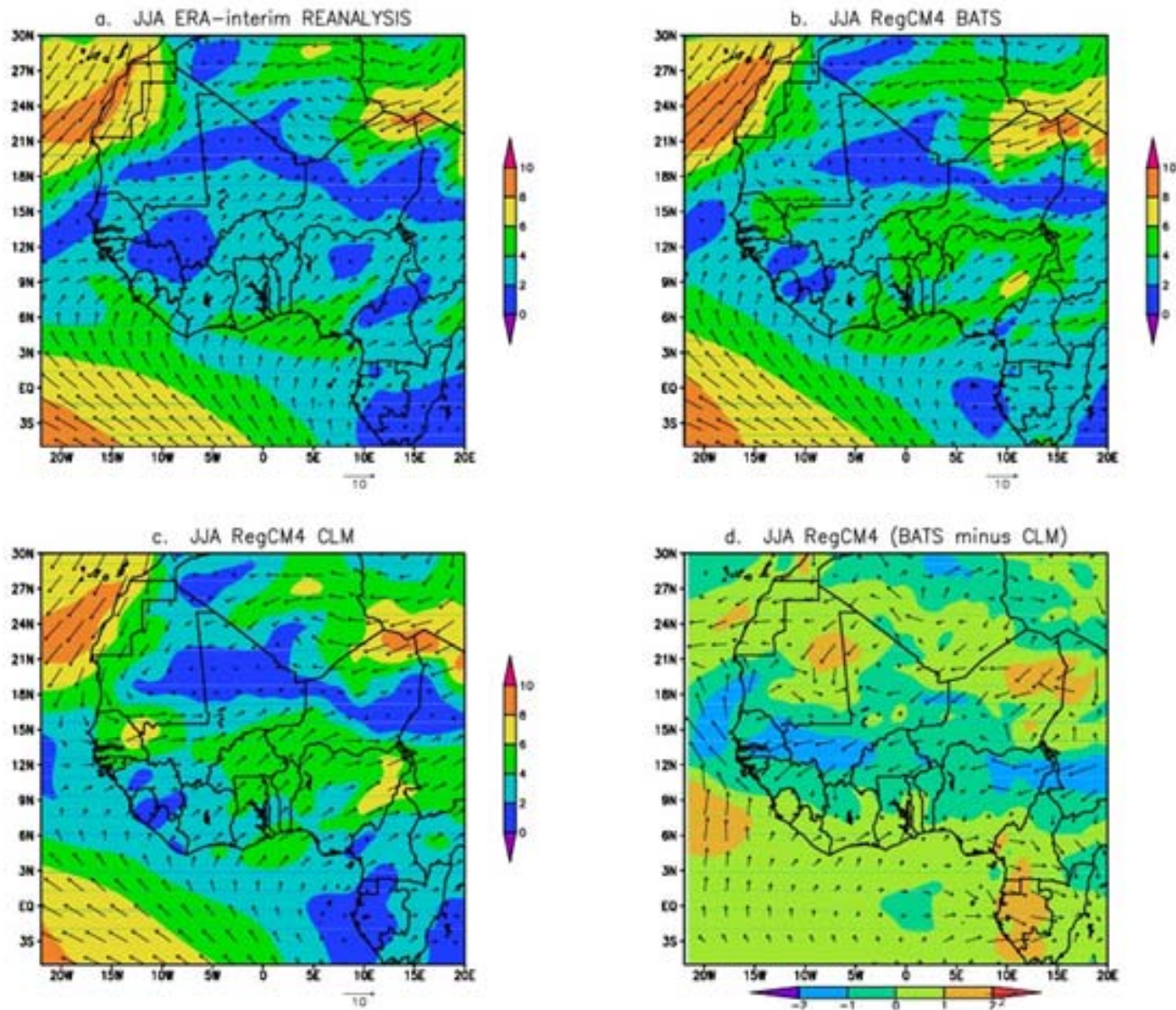
-RegCM4 and Era-Interim shows the same monsoon flux characteristics (Northward propagation).
- Slight overestimation of the monsoon flux over Sahel especially for CLM

Wind at 650 hPa

a. JJA ERA—interim REANALYSE

b. JJA RegCM4 BATS

c. JJA RegCM4 CLM

d. JJA RegCM4 (BATS minus CLM)
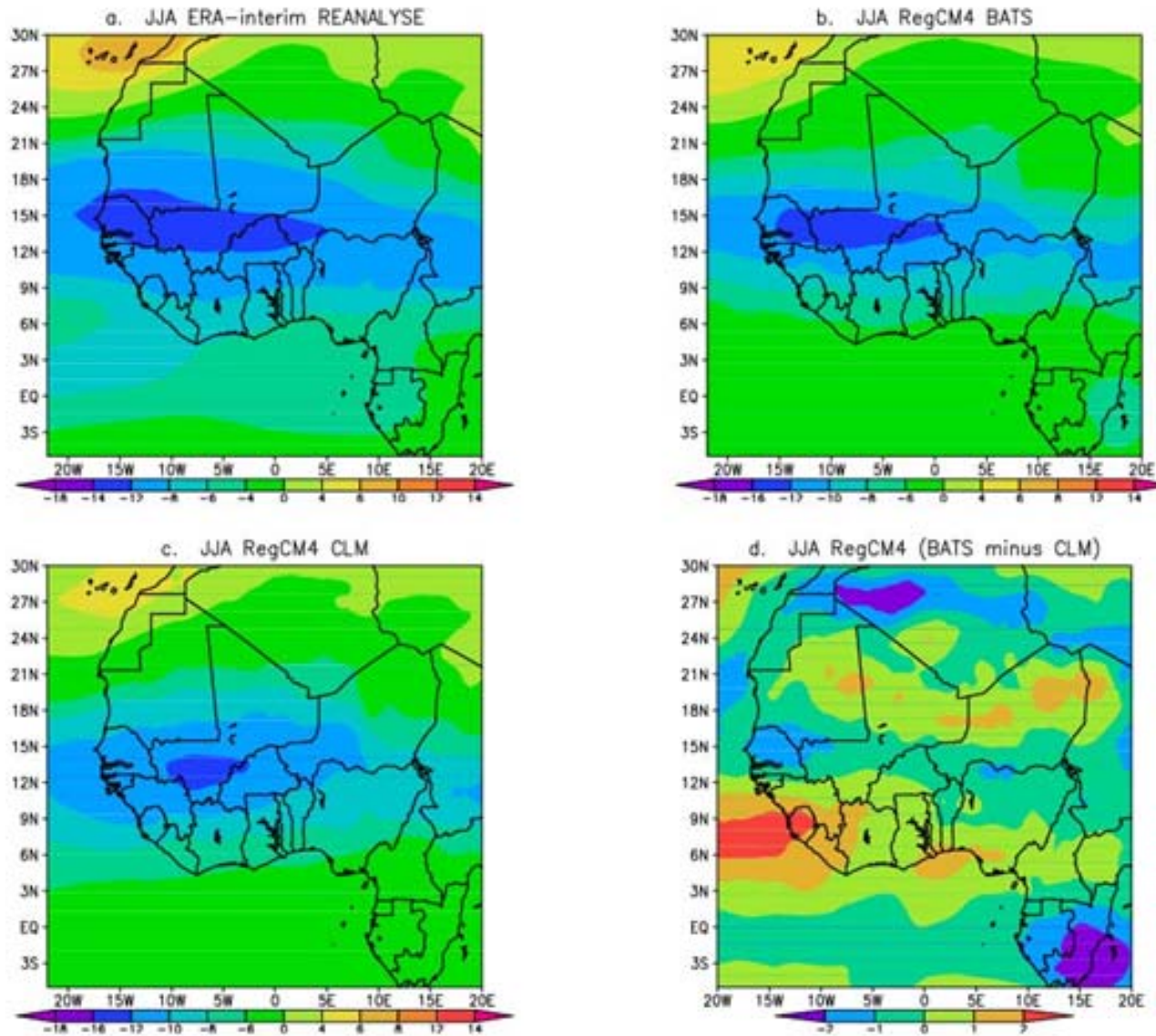
- **RegCM4 captures well AEJ but underestimates the spatial extension of its core.**
- **BATS captures better the postion and strength of AEJ core**

Conclusion :

1. During the summer season of 2006, Regcm4 simulates well West african climate

characteristics including rainfall, Surface temperature, low-levels monsoon flux and AEJ.

2. BATS simulates better West african climate than CLM